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A new approach to research and theory development for financial firms - Building a 'house with windows'

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Abstract

Purpose:
The aims of this paper are to: rethink empirical models and theory used in explaining banks and financial institutions (FIs); and to enhance the process of theory construction.

This is a provisional response to Colander et al (2009), Gendron at al (2013) call for a new approach to developing theory for finance and financial institutions

Approach:
An embryonic 'behavioural theory of the financial firm' (BTFF) is outlined based on: field research about banks and FI firms; and relevant literature.

The paper explores 'conceptual connections' between BTFF and traditional finance theory ideas of financial intermediation (FTFI). It does not seek to 'integrate' finance theory and alternative theory in 'meta theory', and has a more modest aim is to improve theory content through 'connections'

Findings:
The 'conceptual connections' provide a means to develop ideas proposed by Scholtens and Wensveen (2003. They are part of a 'house with windows' intended to provide systematic means to 'take data from the outside world' whilst continuously recognising 'the complexities of the context' (Keasey and Hudson, 2007), to both challenge and build the core ideas of finance theory.

Research implications:
The BTFF is a means to create 'conversations' between academics, practitioners and regulators to aid theory construction. This can overcome the limitations of such embryonic theory.

Practical implications:
The ideas developed create new opportunities to: develop finance theory; propose changes in banks and FIs; and suggest changes in the focus of regulation.

Originality/value
Regulators can use the expanded conceptual framework to encourage theory development and to enhance accountability of banks and FIs to citizens.

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Introduction

The paper seeks to rethink empirical models and theory used in explaining banks and financial institutions, and to enhance the process of theory construction. The paper argues that ideas and assumptions of change, learning, knowledge, social networks and power**,** are implicitly built into traditional finance theory. This shows the potential for connections between alternative ideas and finance theories. The change strategy for finance research and theory construction involves using a combination of: empirical and alternative theoretical narratives, to develop a 'behavioral theory of the financial firm' (BTFF). This is used to develop 'conceptual connections' to traditional finance theory of financial intermediation (FTFI). The combined ideas form a more comprehensive explanatory framework for banks and FIs. They provide means to address some of the problems identified with traditional finance theory, and to develop a strategy for active theory construction.

'Behaviour' in the paper refers to actions by financial firm agents such as learning, creating knowledge and social resources, and mobilising these resources in organisations and market networks. It also refers to biases and risk taking behaviour by individuals in financial markets as expounded in Behavioural finance theories (Statman, 1999).

The paper explores how financial firms use social and knowledge resources to create information, control behaviour, and enhance decision conditions when exploiting financial resources. They mobilise intangible resources to reduce information asymmetry and transaction costs. They do this to enhance liquidity management, diversification, and risk management. This creates conditions for financial intermediation and hence the transformation of financial capital and its risks.

This is not an attempt to develop an integrated 'meta' theory. The aims are to position the ideas about Banks and FIs and empirical insights relative to alternative relevant literature, and demonstrate their collective power in interpreting the combined phenomena. A modest aim is, to develop a 'conversation' between academics adopting different paradigms, relative to shared, common, empirical phenomena. 'Conceptual connections' can provide the basis for connected 'conversations' and social interactions between many parties about theory based on different academic assumptions and views (paradigms) of the world (Morgan and Smircich, 1980). Such a conversation is a critical ingredient in theory construction.

As a result, the paper constitutes an embryonic response to Gendron's et al (2013) call for paradigmatic diversity in finance theory, and Colander's et al (2009) call for *'major reorientation in these (finance research) areas and a reconsideration of their basic premises'*. The paper develops a strategy to build a 'house with windows' by proposing new ways for finance theory to *'take data from the outside world'* whilst continuously recognising *'the complexities of the context'* (Keasey and Hudson, 2007). It therefore develops a stream of thought begun by Allen and Santomero (1998), and extended by Scholtens and van Wensveen (2003), Keasey and Hudson (2007), and Holland (2010).

The new approach can alter the intellectual assumptions on which regulatory actions are based (Turner, 2009), and provide a new analytical tool for policy makers and regulators. Regulators must broaden the focus of regulation and regulate change, learning, knowledge, culture, and not just regulate conduct concerning financial transactions. They must focus on knowledge and social resources, not just financial resources in banks and FIs. They must 'stress test' management knowledge, financial firm organisation, culture, as well as 'financials'. They must do this in an integrated and coherent way.

Section 1 discusses the use of, and problems with, traditional finance theory in the field of banks and FIs. Section 2 outlines a change strategy for research and building theory about banks and FIs and their agents. This forms a new basis for explaining banks and FIs and addressing problems. Section 3 develops an 'empirical narrative' for banks and FIs based on field research. Section 4 outlines an embryonic 'behavioural theory of the financial firm'. This is based on literature about: change and evolution, intellectual capital, management theory, theory of the firm, and sociology of finance literature; matched to empirical phenomena. In section 5, the ideas from the BTFF are 'connected to' specific finance theories of financial intermediation. BTFF and 'connections' to FTFI must have responsive, forward looking elements to create a robust conceptual framework for varying change conditions. If managers, regulators and academics wish to exploit FTFI they must be aware of such dynamics and not use a static version of FTFI by itself. Section 6 explores; how regulators and research councils can use such ideas to drive forward a new change strategy for research and theory construction, and outlines implications of the paper for regulation. Section 7 summarises the paper.

1. Traditional finance theory – content, uses and problems.

This section of the paper discusses the nature and uses of traditional finance theory in the area of banks and financial institutions (FIs). It also explores two closely connected problems concerning explanatory power of finance theory for financial institutions (FTFI) for banks and FIs, and the way theory is constructed.

Buckle et al (2011) noted that a number of related theories are used to explain why and how financial intermediaries exist by reducing or solving market imperfections. These included theories of: asset transformation, transaction costs reduction, liquidity insurance, informational economies of scale, and delegated monitoring. These ideas about banks and FIs were supported by concepts of market efficiency, risk diversification, risk sharing and risk spreading. The latter ideas originated in equity markets. They were adopted for bank and FI balance sheets, and for financial transactions in markets (Lewis and Davies, 1987). Traditional theory is very powerful in explaining economic processes in Banks/FIs and their banking and financial markets. It is especially important in explaining how risks arise with financial resources in banks and FIs and how they can be managed. This is what the theory was designed for, and its core elements (or structure, purpose and theory development method) are widely accepted. The theory and its level of abstraction and focus are particularly effective in periods of stability and gradual change affecting; the finance system, banks, other financial firms, financial products, customers and markets.

The above theories overlap and compete when explaining the purely financial aspects of banks/FIs and financial intermediation. Each theory explains part, but not all, of bank or FI financial activities. They are theories of financial resources and their risks only, and normally ignore intangible resources and their risks in the financial firm. Each theory focuses on and analyses parts of financial processes and activities in banks/FIs (eg liquidity management or deposit and loan transaction costs issues). In their analysis they assume other non financial processes and activities in banks/FI firms are constant (or ceteris paribus) or can be ignored. This perspective has historically been very successful in analysing parts of the financial intermediation process in depth.

Problems in this theory perspective began to emerge in the 1990s in terms of: limited explanatory power, narrow focus, difficulty of implementation, and poor responsiveness to change. For example, Scholtens and Wensveen (2003) argued that the neo classical view had insufficient explanatory power for banks and FIs. Contrary to established theory, the empirical evidence supported the view that banks and FI firms created and exploited imperfections in financial markets, and continued in existence through their own efforts. Traditional finance theory did not capture the need of Bank and FI firms to change, innovate and create new products as means to add value (Merton 1995; Scholtens et al, 2003).

The latter have been particularly important in the period 1980 to 2018 where much change and evolutionary processes occurred in banks and FIs. From a traditional finance theory viewpoint, the role of changing knowledge, organisation form, and social structure in banks/FIs was to reduce agency costs, improve risk management and add value. However, for banks and FIs the more dynamic aim was to create and use knowledge and social resources to develop new forms of value creation with financial resources. Continuing reduction (and in some cases increases) of agency costs and transaction costs was achieved as by-products of, evolutionary and strategic processes, and resulting changes in value creation purpose and activity (Scholtens and van Wensween (2003).

In a similar vein Keasey and Hudson (2007) noted the problems of ignoring the wider contexts of finance, or of selectively choosing 'facts' from this world to support core ideas in theory.

'finance theory maintains both its momentum and hegemony… keeps itself artificially alive by taking data from the outside world, often ignoring the rich complexities of the context which has given rise to the data, and using these 'new facts' to create puzzles which then lead onto more activity to see how the accepted core can or cannot be extended to incorporate the 'new facts' '

Thus, traditional finance theories by themselves are inappropriate to explain the primary function, purpose, and behaviour of banks and FIs. They cannot explain the change process in banks and FIs in the

form of creation of new knowledge, and new social and market structures. They cannot explain: changing business models and value creation process, the emergence of new sources and uses of financial resources, and development of new financial products and new transacting means. They cannot explain how knowledge and social resources in the financial firm were mobilised to exploit financial resources.

The GFC in 2007-09, demonstrated major limitations of traditional finance theory. Turner (2009) argued:
'…the crisis ..raises important questions about the intellectual assumptions on which previous regulatory approaches have largely been built…At the core of these assumptions has been the theory of efficient and rational markets. ……these assumptions is now subject to extensive challenge on both theoretical and empirical grounds'

The GFC highlighted limitations of established theory and reinforced views that change is required. Authors such as Colander et al (2009) and Gendron et al (2013) discussed how the crisis had exacerbated problems and stimulated the need for a new approach. Gendron et al (2013) argued that,
'the core of finance research has largely failed to invest in the promotion of paradigmatic diversity, and continues to resist the idea. Yet, the stakes involved are significant, since finance's lack of diversity in research paradigms arguably translates into a body of knowledge that presents important limitations when trying to make sense of important phenomena, not least of which are infrequent but highly significant events unfolding in the political economy'

The GFC also revealed major problems in bank/FI social networks and knowledge. The GFC showed how elite and operational agents in financial firms used their social networks and power to control the definition of what was knowledge and information, and influence private use of these resources in many kinds of financial firm transactions. As large and powerful 'insiders' in the networked world of finance, they mobilised their tangible and intangible resources to create superior and private information, and to generate wealth, relative to 'outsiders' as small savers and investors. Misuse of power over intangibles and hence over information and transactions contributed to the GFC (Holland, 2010), and ongoing problems of public confidence in the finance sector.

The GFC has reminded Banks and FIs that risk management is not a question of managing financial resources and their risks alone in a 'basic' model of financial intermediation. Top management in these financial firms have learnt that risks arise with their knowledge, social, and technology resources. The intangibles risks interact with and create risk in their financial resources (Kan, 2014). They have learnt they must 'juggle' or manage the combination of intangibles risks (knowledge, social relations), tangibles risks (technology), and financial risks together; in an 'advanced' model of financial intermediation (Holland, 2010). Traditional finance theory does not deal with this critical area arising in 'real world models'.

Implicit role of change, IC, and relations in Traditional finance theory

This paper, developing Keasey and Hudson (2007, argues that some ideas of learning (Allen et al 1998), specialised knowledge (Leland and Pyle, 1977) and capabilities (Scholtens et al 2003), information advantages, social networks and power are selectively 'sampled' by finance theorists in an ad hoc way from external contexts. They are implicitly and on occasion explicitly 'built into' traditional finance theories of banks and FIs. This has been an established way of briefly introducing 'real world' insights to theory.

For example, traditional finance theory recognises the role of knowledge intensive intangible factors such as reputation and brands in economic processes in financial firms such as retail banks and investment banks (Scholtens et al 2003). Knowledge (as financial expertise) and 'relationship' social resources in banks/FIs are also assumed to be implicit in areas such as specialised assets, lending routines, credit scoring, or diversification of risks (Holland (1998, 2005, 2006). Knowledge and social resources are assumed to be part of: the organisation of branch networks and information systems, standardised products and contracts, tested procedures and routines, and information technology. Intangible resources and advantages are assumed to be present, but they are normally not made explicit, when developing arguments for traditional finance theories.

As a result, traditional finance theory for financial institutions (FTFI) does not explain what the intangible resources are, how they are acquired, or how they change. The ad hoc approach to 'building in' knowledge and social resources into traditional theories does not systematically capture many empirical insights about

intangible use in 'real world' models of Banks and FIs developed by authors such as Hellman, (2000, and Coleman, (2015). Given a focus (on financial resources) and use of core assumptions (epistemological, ontological), the established finance theories are not based on a coherent integrated view of the full use of resources in the bank or FI. They do not seek to explain the connected role of many intangible resource factors: such as organisation, routines, social networks, reputation and power; in Banks/FI financial firms, and with their customers. They do not explain their roles in integrated business models, financial transactions, liquidity production, and financial intermediation. They do not explain how these intangible resources offset, contribute to, or exacerbate financial risks. They do not systematically explain the role of intangibles in the transformation of financial capital and its risks. This is despite knowledge intensive assets and capabilities being key to bank and FI specialism, competitive advantage and performance (Gendron and Smith-Lacroix, 2013); as well as being critical factors in bank/FI success and failure in the GFC (Holland, 2010).

This paper argues that there is a need to connect broad ideas of financial firms in their social, knowledge and economic contexts, to ideas of financial transactions and financial intermediation. This requires connections between ideas about change, the role of intangibles and technology, and ideas about financial intermediation in banks/FIs. This reflects Scholtens et al (2003) idea that we should view 'financial intermediaries from an evolutionary perspective' and we should develop theory about financial institutions conducting financial intermediation services rather than about financial intermediation per se.

2. A change strategy - creating a 'house with windows'

This section explores how a theory construction and change strategy can form a new basis for explaining and understanding banks and FIs and address some of the problems of finance theory. The above can be interpreted as developing a change strategy to build a 'house with windows' (Keasey and Hudson, 2007) in the fields of practice and academe in finance.

The first part of the change strategy involves developing an embryonic 'behavioural theory of the financial firm' based on empirical and theoretical narratives (Golden-Biddle and Locke, 2007). The second part involves the search for potential conceptual 'connections' between alternative ideas of the financial firm, and traditional finance theory ideas (Buckle et al, 2011).

The empirical narrative is derived from field work on, business models in case banks and FIs, and their relationship with financial intermediation and risk management. It shows how social structures and knowledge interact with finance resource factors and processes in banks and FIs. The narrative also illustrates change and learning processes, knowledge creation, and developing new forms of financial firms. The active use of field research proposed in this paper reflects Gendron's at al (2013) call for an academic 'commitment to research diversity and engage more thoroughly in the examination of finance in action'.

Alternative theory is used to interpret and explain the empirical narrative and develop an embryonic 'behavioural theory of the financial firm'. This is based on Theory of the firm such as Cyert and March (1963), Barney (1991), and 'Behavioural finance' theory (Statman, 1999).These sources are explicitly linked to literature on: Learning organisations, social contexts, intellectual capital, business models, and value creation of financial firms (Holland, 2016). Change theory such as Merton (1995) and Scholtens et al (2003) adds a dynamic element to the explanations.

The above is based on an emerging programme of field and qualitative research in finance which focuses on understanding how financial firms function and exploit expert knowledge in social and economic contexts. This includes Holland (1994), Hellman (1996), Holland and Doran (1998), Holland et al (2012), Lord (2014, Chen et al (2014), Coleman (2015), Holland (2016). In this approach social context and expert knowledge in financial firms, are explicitly recognised as key elements in financial decisions and financial risk management: at transaction, portfolio and firm levels in banks/FIs; and hence in transforming financial capital and its risks.

This approach differs to proposals by Allen et al (1998) and Scholtens et al (2003) to adapt theory of financial intermediaries. Scholtens et al (2003) proposed new ideas within the conventional finance paradigm and sought to 'look out' to alternative theory sources for new ideas or assumptions to 'build into' and adapt finance theory. There are limits to this approach given the assumptions (ontological, epistemological) and financial resource focus of finance theory. There are limits to 'squeezing' ideas about social and knowledge resources in the financial firm into a finance theory framework not designed to look at these matters (Keasey and Hudson, 2007).

The approach does not seek to 'integrate' traditional finance theory with empirical narrative and alternative theory perspectives. There are too many epistemological and ontological differences (Morgan and Smircich, 1980) between the assumptions of positivism in traditional finance theory and the assumptions of say symbolic and contextual analysis underlying sociology and management theoretical sources. It is not feasible to 'build in' a set of ideas of the financial firm and it knowledge and social resources into a larger theory of finance. However the paper demonstrates that there are other ways of potentially 'connecting' and combining these theory sources without seeking to develop a 'meta theory'.

3. Developing an empirical narrative

In this section 'field based stories' or 'empirical narratives' (Golden-Biddle and Locke, 2007) are developed for empirical findings about connected financial, social and knowledge based processes of banks and FIs. Gendron et al (2013) define investigating finance in action within context as;

'…comprise the questioning of formal and rationalized accounts of practice, and the studying of the complex backstage of practice in its socio-organizational context. The dynamics of the work of finance practitioners and financial institutions and how it changes over time will also be considered'

In this paper 'formal and rationalized accounts of practice' concern, knowledge intensive business models in bank and FI financial firms, and their relationship with financial intermediation and risk management. The 'studying of the complex backstage of practice in its socio-organizational context' involves analysis of how social structures and knowledge were mobilised by banks/FIs to interact with financial resources and financial decision processes in financial markets. This also includes change and learning processes, and the creation of knowledge and resources in new advanced forms of financial firms. These collectively form the basis for developing an explicit empirical narrative.

The role of knowledge based intangibles and social context in intermediation

Field based research illustrates the role of knowledge based intangibles and social contexts in bank and FI intermediation processes. Examples of the field studies include: Holland's (2006, 2016) research into fund manager firms, Chen et al, (2014) study of banking firms, Holland et al (2012) research into venture capital firms, and Chen et al's (2016) study of financial analysts in investment research firms. The GFC also revealed the central role of (failing) knowledge based intangibles and social contexts in banks (Holland, 2010). The field studies and GFC events are used to construct the empirical narrative.

The field studies were used to explain each specialist type of financial firm as a 'grounded theory' (Locke 2001). They show the central role of many connected knowledge and social (intangibles) resources in financial and information intermediation processes in Banks and FIs. Each financial firm had a unique combination of resources, integrated in a business model and driven by strategy and profit aims (IIRC, 2013). This was intended to create a unique and sustainable competitive advantage (SCA) (Barney, 1991) for each firm. It was intended to create special expertise (Merton, 1995) for use in information production, transacting and risk management; and hence in transformation of financial capital and its risks. Management mobilised combined resources and perceived advantages to enhance financial transacting and intermediation processes in the expectation that this would lead to competitive success. However, the GFC revealed that such intentions and perceptions were illusory. This suggests that the literature on sustainable advantage should also focus on such cases where competitive disadvantages were created leading to major problems and failure.

Knowledge resources included intellectual capital (IC) (Meritum, 2002) about financial firms and capabilities of teams and individuals. They comprised understanding of: organisation, hierarchy, process, culture, routines, and teams; within financial firms. They included knowledge of: external social networks and relations, power and processes; that banks and FIs have with customers and market participants. They involved knowledge of financial needs of customers, of financial transactions, and of banking and financial markets. They comprised financial expertise (Preda, 2005) or understanding of pricing mechanisms in financial markets and the role of intangibles such as brand, reputation, and customer relations in supporting transactions in these markets. They included knowledge of financial intermediation and risk management at financial portfolio (asset, liability) and financial firm level (Lewis and Davies,1987).

The field studies also revealed how various **social contexts and resources** in the bank/FI and its external world were central to bank/FI economic processes. Within the firm, social factors involved areas such as organisation hierarchy and power (Stein, 2002), organisational culture (Schein, 1989), and organisational process (Cyert and March, 1963). Banks / FIs used collective organisation resources to disseminate information, influence desired behaviour, and control risk taking. Banks/FIs also operated in external networks of social and economic relations. The networks existed on both supply side for funds, and demand side for provision of financial services (Holland, 1994).

Use of social and knowledge resources in intermediation

Each Bank/FI as a financial intermediary used knowledge and social resources to create information and control behaviour. This was the basis to transform financial (asset and liability) capital and risks and to achieve a profit. These processes occurred within the bank/FI firm as well as its specialist financial markets and associated social networks.

Social networks in financial markets supported information search and exchange with customers, clients regulators and others. Information about customers or clients as financial resource users and suppliers was acquired during transaction activity in the networks. It was processed and analysed by bank/FI agents within their financial firm contexts (Holland, 2006; Chen et al 2014). These information production activities in social networks were core parts of the financial firm's ability to intermediate funds and financial services between different resource suppliers and users. Regular and effective transacting in market networks was key means to maintain confidence in the firm and build its reputation. Information was exchanged with regulators about these financial transaction and financial intermediation activities to assure regulators that 'good practice' and mandatory requirements were satisfied, and thus maintain confidence in the financial firm in market social networks.

Social network factors: such as power, good reputation and quality brands, relative to external clients, customers, suppliers, and regulators; were used in market social networks and expected to increase financial transaction success and confidence in the firm. Firm agent (top management, front office) knowledge of social networks in markets and of expected behaviour of external agents (customers, competitors, regulators) was important in the control of risky behaviour and transacting and in reducing decision costs for bank/FI agents on both fund supply and financial service demand sides. Agent knowledge of, and power in, financial firm social contexts (internal and external), were key to creating and using new information – both soft and hard – in specialist intermediation processes (for example in retail banks in Chen et al 2014; or fund managers, Holland, 2016). These social resource factors could, at times, be the means to manipulate and bias information flows to weaken competitors and exploit and perhaps defraud clients and customers (Holland, 2010). Such potential misuse use of social and knowledge resources should be the focus of attention of regulators as much as the eventual financial transaction and portfolio outcomes.

Change and bank/FI learning and knowledge creation

The empirical narrative can be extended by using field research about bank/FI response to change. Research by authors such as: Harris (2002), Antonacopoulou (2006), Shih et al (2010), Holland (2010), Holland et al (2012), Chahal et al (2015); illustrate how banks and other financial institutions respond to change, learn, and create knowledge based intangibles relevant to effective functioning of the financial firm. Top management and front office staff in financial intermediaries (banks and FIs) learnt over time how to create knowledge embodied in new products, and to overcome, and at times create, market imperfections. The idea that banks and FIs exist because of imperfections has been countered by the idea that imperfections exist and persist because of value seeking banks and FIs (Scholtens et al, 2003). The creation of imperfections and power over transacting is considered to be legal and amoral by agents in financial firms (Luyendijk, 2016). When driven by greed their actions have mutated into immorality and illegality as in mis-selling and Libor cases.

Studies by Harris (2002), Antonacopoulou (2006) and Holland et al (2012), provide insights into learning about the financial firm. Top management and front office staff learnt how to develop: bank or FI organisation and hierarchy (structural capital), the skills and capabilities of their teams and individuals (human capital), and their relationships, brands and reputation with customers and other external agents (relational capital). Bank/FI learning over time created special knowledge in 'front office' teams about customer behaviour in markets and social settings, and in 'back office' teams about administering transactions, monitoring performance and risk. Bank/FI learning over time created special knowledge in top management teams about asset and liability portfolios and how to manage bank/FI firm wide risks. Learning created specialist knowledge about decision routines, teams and individual skills. Such processes occurred in banks and other FIs such as pension funds, insurance companies, and fund managers.

Agents in financial firms sought to create knowledge about their customers (Holland et al, 2012). They tried to understand their roles as banks and FIs in the social 'network' value creation process with their finance suppliers and users, and the role of bank/FI intangibles (reputation, brands) and tangibles in supporting this economic process. For example, retail banks sought special insights into savings, spending and borrowing behaviour by customers and by others in the retail banking market (Chen et al, 2014). This knowledge was the means to create special and private information about customers, and close economic 'relationships'. These formed key parts of the competitive advantage for the retail bank.

Banks and FIs also sought to learn how risks arose in social situations, in knowledge assets and technology. Risks have arisen in social situations when problems occurred in internal financial firm culture and governance, external community relations, and customer relations (Sen, 2015). Before the GFC risks arose in knowledge assets when: top management did not understand changes in markets and in the business model of the financial firm; and 'front line' staff did not understand changing customer needs and behaviour (Holland, 2010). Major risks arise from technological change and emergence of innovations in social media. For example, the combination of technology and social media, can quickly magnify problems with existing financial liabilities and assets, and erode trust and confidence in the bank (Culp, 2014).

Sen (2015), noted how Samuel Tsien as Chief executive of OCBC bank in Singapore compared the running of bank to being a 'juggler' of many financial and intangible risks for profit**.** These included managing risks: associated with bank social and reputation capital, organisational capital, human capital (Meritum, 2002), and with regulators; as well as their combined impact on risks of financial capital. Tsien, (in Sen, 2015),said:

"bankers today not only have to meet expectations of ..stakeholders in delivery of services and in results, they must also pay attention to the increasingly-strident demands of communities, citizens and politicians. ….have to reshape the bank's organisational culture to meet the highest demands of trust, honesty and integrity, fair dealing, corporate governance and social responsibility….Because.. of jump in ..regulations since 2008 GFC compliance costs have increased. …these costs cannot be passed on to customers, shareholders get reduced returns, ...Further, with pervasive multiplier effect of social media these days, banks are exposed to much higher reputational risks ….What starts off as a blip that could dent a bank's reputation can quickly escalate into a full-blown crisis, with enormous financial and regulatory impacts….This is not easy, only a smart juggler can do it."

Problems in learning and knowledge creation

Major events such as the GFC in 2007-08 showed how learning about interactions between intangible and financial resource factors can go wrong and banks/FIs and markets can fail. In 2000-06 before the GFC, major (combinations of) of Bank/FI problems arose over time in intangibles such as: the quality of top management, their incentive schemes, their understanding of new risky bank models, and their ability to learn about change (Holland, 2010). This led to high exposure to financial risk, and increases in risk taking. When these negative conditions coincided with major adverse events (economic, political etc) in 2007-08, they led to bank firm failure and banking market problems. Failure arose with knowledge based intangibles such as experience based financial expertise in Banks/FIs in top management and front office staff (Holland, 2010). Failure arose with a misplaced trust in established finance theory when it was used as an ideology rather than tested ideas. Beliefs that efficient markets could value complex instruments (with valuation based on finance theory) were found to be in error (Turner, 2009). These created further problems with the transformation of financial resources and their risk in financial intermediation processes.

In the post GFC period, rapid change and new problems have emerged with increased regulatory requirement, global internet usage, digitalisation of financial services, and risks of digital disruption. Tsien (2014) in Kan (2014) argues that:

'Bankers, therefore, must be skilled in managing complexity. This in turn requires an intimate knowledge of many fast-changing facets of today's world... Bankers need to understand the inter-connectivity between financial markets and economies, the speed and ease with which capital and investment funds flow and information gets distributed, and the rise of social media and alternative payment providers, along with the systemic risks that come along with them.'

The above highlights the need to use the above ideas to develop ongoing diagnosis of: change, 'innovation', and new regulation post GFC. Financial firms must identify emerging problems with knowledge based intangibles, social resources and technology, before they adversely affect the core financial intermediation processes and risks.

4. Developing a 'behavioral theory of the financial firm' (BTFF)

This section investigates how an alternative 'theoretical narrative' can be used to interpret and explain the 'empirical narrative'. The theoretical narrative and its interpretation of the empirical narrative are presented as an embryonic 'behavioral theory of the financial firm'. The alternative theory view is based on (non finance theory) literature about: change and evolution, learning organisations, intellectual capital, theory of the firm, behavioural finance, and sociology of finance; matched to the empirical phenomena. The literature has been chosen for its relevance to the empirical narrative and from comments during presentations.

The 'behavioral theory of the financial firm' is briefly outlined as follows.

The field studies illustrated how in a world of change, learning and adaptation by top management and other agents of bank and FI firms, led to new knowledge and capabilities in bank and FI teams. This is interpreted as top management in 'Learning organisations' (Pedler et al 1997) gaining knowledge to strategically allocate capital (financial and intangible) to create an effective organization. They created a financial firm with a unique combination of resources, both intangible and tangible. 'Behaviour' in this paper refers to actions such as learning, and mobilisation of resources, in organisations and social networks (Cyert and March, 1963); as well as the ideas from behavioural finance theories (Statman, 1999).

Board and Top management teams directed strategy, and developed mechanisms to mould and transmit the chosen philosophy, culture, incentives and risk management ethos of the firm. They decided on the nature of internal resources such as knowledge, organisation and hierarchy, organisational processes, routines, technology and financial reserves. The internal resources were strategically matched to the external environment (customer needs, social networks, market conditions, competition, and technology change) but also changed with learning and circumstances (Teece et al, 1997). The intangible and tangible resources were designed to create a sustainable competitive advantage unique to each financial firm. This was based on a unique, difficult to copy, combination of resources, both tangible and intangible as noted in the 'Resource based view of firm' (Barney, 1991).

The combination of knowledge intensive intangibles and tangibles were integrated in bank/FI business models and value creation chains (IIRC, 2013) and expected to be the basis for winners and losers to emerge in banks and specialist FIs. The resources and their advantages were mobilised to maximise the financial benefits from financial resources during financial transactions and intermediation. They were designed to create superior ability to overcome problems of information, behavior, and risk management; and to enhance the production and sale of Bank/FI products and services. They were developed to control behavior in the firm, market social networks, and markets. They were intended to create: superior information collection and evaluation capabilities in decision teams, about transactions, and about portfolios of transactions; and to enhance liquidity and create the conditions for the transformation of financial capital and its risks. They were designed to: make financial intermediation possible, to differentiate Bank/FIs, and to make them competitive.

The resulting financial firms can be interpreted as evolutionary (Nelson & Winter 1982) responses to uncertainty. Their organisation structures, resource use processes, intermediation processes, external social networks, and shared firm wide knowledge; were developed by their top management and other agents in a common institutional and market setting (Scott and Meyer, 1994; Scott, 2001).

Mobilising combined resources to control combined risks

The brief theoretical narrative can be expanded by exploring the role of combined knowledge (intellectual capital) and social resources in more detail (Holland, 2017). From a bank/FI management perspective the combined knowledge and social resources were integrated means to cope with risks associated with financial resources. They were the means to reduce and exploit information and behaviour problems with financial resources at transaction and portfolio levels. They were means to reduce the uncertainty associated with financial asset, liability and risk management decisions (Hellman, p236, 2000). When resources were combined and mobilised in coherent ways, they were important organisational means for uncertainty avoidance and conflict resolution, in the manner suggested by Cyert and March (1963). They were the

means to create information advantages and influence over customers, reduce decision costs (Stein, 2002) and to lower the costs of transacting.

As noted in section 3, banks and FIs learnt how risk occurred with combined intangible and financial resources (Holland, 2010; Culp, 2014; Sen, 2015). The risks of intangibles and tangibles interact and can have a negative effect on the supply of funds, financial performance of assets, and liquidity of both liabilities and assets. They can have negative effects on transaction cost, liquidity, and financial intermediation. The complex 'juggling' of many different tangibles, intangibles, and financial resources; their combined risks and benefits; requires a coherent strategy and comprehensive idea of the bank or FI business model. The 'behavioural theory of the financial firm' seeks to make these issues explicit.

Change, and Merton's spiral.

The 'behavioral theory of the financial firm', can be further developed using Merton's (1995) theoretical ideas on how change occurred in banks, FIs and the financial system. Merton and Bodie (2005) argued in their theory of 'functional and structural finance' (FSF) that economic functions of the financial system were stable 'anchors' or 'givens' and environmental changes stimulated bank and FI learning and evolution towards satisfying these functions. Thus the mechanisms of environmental change, organisational learning (Pedler et al,1997), competitive pressures and strategic choice (Teece et al, 1997), can be interpreted as primary means by which financial firms evolved over time (Nelson & Winter 1982) in a common institutional setting (Scott, 2001) in the direction of Merton and Bodie's (2005) economic functions of the financial system.

The dynamic change in economic processes observed over time in case Banks and FIs and active learning were examples of Merton's 'financial innovation spiral' (1995). This was where key bank and FI intangible resource elements such as: *business models, value creation chains, and relative competitive positions in markets;* evolved together over time. At the same time financial resource elements such as: *the forms of financial and information intermediation, associated financial and information products, related risk management services, product users and their needs, and the wider market for these bank and FI products*; evolved together over time.

Bank/FI learning at team and individual levels: created new knowledge as human, structural, and relational capital (Meritum, 2002); concerning all of the evolved elements and hence evolution of the firm with integrated intangible and financial resources. This knowledge informed bank/FI decisions about changes in these elements. The above reflects Scholtens et al (2003) view that understanding the evolution of financial institutions conducting financial intermediation should be the focus of research rather than financial intermediation per se.

5. Exploring the potential for conceptual 'connections'.

This section explores the potential for conceptual 'connections' between BTFF and each specialised theory of financial intermediation. Initially, it assumes stable or gradual change conditions for the influence of intangibles on financial resources. It subsequently explores how rapid change and uncertainty conditions create problematic conditions for use of finance theory (FTFI) and financial expertise, hence contributing to problems for managers, regulators, and academics.

Thus the BTTF and 'connections' to FTFI must have responsive, forward looking elements to ensure a robust conceptual framework is created for varying conditions. Financial firms have to respond to varying change conditions and to formally manage their learning. They can use the BTFF to support contingency planning and early warning systems by designing robust intangibles to support financial resource use in range of circumstances. They can use this to continuously respond to, create and exploit market imperfections (Scholtens and van Wensween, 2003) or new versions of the information, transactions cost and behaviour conditions assumed in FTFI. If managers, regulators and academics wish to exploit FTFI in a changing world they must be aware of dynamic conceptual connections between BTFF and FTFI and not use a static version of FTFI by itself.

What are the proposed 'conceptual connections'?

The conceptual connections are developed by relating concepts in the 'Behavioral theory of the financial firm' to concepts in the 'finance theories of financial intermediation' (FTFI). They include connections between BTFF concepts such as: *knowledge, organisation, social networks, and the mobilisation of these resources;* and FTFI concepts such as: *information asymmetry in financial resources, transaction costs, liquidity management, diversification, risk management and financial intermediation.*

The BTFF and 'connections' reflect 'integrated thinking' (IIRC, 2013) concerning how the creation and mobilisation of intangible resources produced supportive information and behaviour circumstances when conducting financial transactions and managing financial risk. Financial firms mobilised intangibles to produce and exploit specialist information, create trust, and influence the behaviour of customers and their own agents concerning financial resources. These enhanced bank/FI agent decision conditions when exploiting financial resources.

In FTFI terms they mobilised intangible resources to reduce (and sometimes increase) information asymmetry and transaction costs. They did this to enhance liquidity management, diversification, and risk management. These produced suitable circumstances for: financial transacting and risk management at the level of individual transactions, portfolios and the financial firm; and for financial intermediation or transformation of financial resources and its risks.

The BTFF shows how *special* combinations of knowledge and social intangibles are the underlying basis for assumptions in each finance theory of financial intermediation such as delegated monitoring. The BTFF is used to explore the use of intangibles and information and behavior conditions in each theory. The common and special use of intangibles relative to FTFI theories reveals new connections between the theories, and offer new potential routes for integrating theories. The above also illustrates how connected BTFF and FTFI theories form a more comprehensive explanatory framework for banks and FIs; than the FTFI set of theories alone.

Examples of broad conceptual connections can be made explicit as follows. Heffernan (2005) related the ideas of organisation, monitoring, contracting, and incentives structures to the rationale for the financial firm relative to markets.

'… core functions of a bank are more efficiently carried out by a command organisational structure, because loans and deposits are internal to a bank. Such a structure is also efficient if banks are participating in organised markets. These ideas were developed … by Alchian and Demsetz (1972), who emphasised the monitoring role of the firm and its creation of incentive structures. Williamson (1981) argued that under conditions of uncertainty, a firm could economise on the costs of outside contracts'

(Heffernan, 2005, P xiii) also noted a problem

'Unfortunately, the structure itself creates principal–agent problems, between depositor and bank, shareholders and management, the bank and its employees, and the bank and its borrowers. Differences in information between principal and agent give rise to adverse selection and moral hazard. Relationship and transactional banking can, in different ways, help to minimise these problems in a bank–client relationship'

In the BTFF, internal based intangibles: such as organisation structure, organisational control, employment contracts and incentive schemes; were designed to reduce information and behavioural problems and hence principal–agent problems, between bank/FI board and top management teams, and between them and middle management and front line employees (Heffernan, 2005)

In addition various market oriented organisational structures and functions in the financial firm, and customer facing intangibles in the financial firm, were designed to control information and behavioural problems; and hence principal–agent problems with external agents. The latter included problems between banks/FIs front line agents, fund users and suppliers, and between bank/FI board and top management teams and equity fund suppliers.

For example, Holland (2010) noted how large banks when forming universal banks in the 1980s reorganized 'their new internal functions around financial and corporate/consumer markets to create a market driven and responsive organization'. Chen et al (2014) showed how customer facing intangibles; and fund supplier facing intangibles were designed to control such problems and maximise benefits. The customer facing intangibles included brand and reputation, contracts and incentive schemes, and socio-economic relations. 'Control' could mean reduced information asymmetry and transaction costs for the financial firm, but not necessarily at the same level for the customer. The latter gained the benefits of transactions and services not fully available to it in open markets.

Dynamic conceptual connections between BTFF and FTFI ideas can be made explicit as follows. The combination of: market aligned bank/FI functions, customer and fund supplier social networks, and successful transacting over time; was the basis for, financial firms and customers to learn together and jointly develop shared intangibles such as 'relations', trust and reputation. These in turn created conditions for further financial transacting, liquidity creation, and transformation of financial capital and its risks. Continued maintenance of such intangibles created incentives for both parties to complete ongoing financial transactions and to engage in future transactions. These dynamic interactions were the basis for financial firms to continue to control information asymmetry and transaction costs between them and customers, making 'relationship' financial transacting possible. If 'relationship' learning was not possible, and private information could not be accumulated over time from customers, then financial firms such as banks turned to 'arms length' transacting using public information, or refused to transact (Holland, 1994).

Thus concepts and variables in BTFF were 'connected' to variables in FTFI and dynamic interactions between the ideas were made explicit. Supportive (or negative) conditions in a set of variables in BTFF (in resources and their mobilisation); were 'connected to' supportive (or negative) information production conditions and expected agent behaviours in FTFI; with this leading to decisions and transactions. There was a strong dynamic element to the connections. The direction and scale of change in one set of variables in the BTFF were 'connected to' equivalent change in variables in FTFI. Ideas of positive (or negative) changes, and of mutual reciprocal interactions in social, knowledge and financial resource factors; were 'connected to' ideas of, learning (or not learning); and to financial innovation (or producing useless and risky products). These were connected to positive and negative changes in information asymmetry and transaction costs; and to changes in financial decisions in financial firms (increase or reduce risk for required return). These in turn were connected to positive and negative changes in financial transacting, delegated monitoring, liquidity production, and asset transformation.

As a result, this section provides examples of how an alternative theory narrative in the form of BTFF can be connected to the traditional finance theory view of financial intermediation (FTFI). At this embryonic stage, 'connection' refers to likely links and inferences rather than formal logical links or empirically tested associations. This approach provides a tentative first step in exploring how to overcome some of the problems faced in using traditional finance theory alone, whilst exploiting the potential of finance theory for

key parts of the explanation in periods of stability and change. However, it should be noted that: epistemological and ontological differences in theory assumptions, core tenets, views of the world, and research methodologies; create barriers between theories. They create barriers to integration of traditional finance theory of financial intermediation, and the theories underlying the BTFF (Morgan and Smircich, 1980). Hence this paper is not an attempt to develop an integrated 'meta' theory. It seeks to position the ideas and empirical insights about financial firms relative to relevant literature, and demonstrate their collective power in the form of 'connected' BTFF and FTFI in interpreting the combined phenomena. The aim is to show how these combined ideas can enhance explanatory power of theory.

5.1 Transaction costs, asymmetric information, economies of scale and scope

Buckle et al (2011) note that the core reason for financial intermediation is the existence of transaction costs. Financial firms reduce search transaction costs through use of branches and other direct forms of customer contact. They reduce costs of assessing financial transactions by supplying standard products, and reduce contracting and monitoring costs by use of specialised contracts and tested decision routines. The BTFF develops these ideas by arguing that transaction cost reduction was also based on Bank/FI intangibles and strengths with these learnt, developed and mobilised over time.

In the BTFF, the combination of market aligned bank/FI functions, customer and fund supplier social networks, and successful transacting over time; is the basis for financial firms and customers to jointly develop shared intangibles such as relations, trust and reputation. They were the basis for the financial firm to generate expert knowledge (Preda, 2005) or financial expertise about valuation models, standard transactions, products, and contracting. They were the basis to develop individual capabilities of front line staff dealing with customers, and knowledge of how to use relationships with customers in their market segments. These resources provided means to produce information, control and direct agent behaviour in the firm, reduce information asymmetries, and to influence customer behaviour.

Active mobilisation of these intangible resources reduced the time and money spent in performing individual financial transactions and hence **reduced unit transaction costs** (of search/screen, monitor, contracting, Dahlman, 1979) for the financial firm with customers. This potentially, but not necessarily, reduced the same problems for customers. When repeated across a large volume of many similar transactions this was the basis for **economies of scale** and hence for low (unit) cost transacting and risk management in the financial firm.

Knowledge and social resources were also the means to produce a variety of financial services from a common resource base. The use of shared resources lowered costs for each product and achieved **economies of scope.** In contrast when products and services were newly created, banks and FI faced weak competition, and mobilised knowledge and social relations to exploit large margins. This could create imperfections in markets and increase **transaction costs** for customers as the bank/FI sought to exploits it monopoly over knowledge, information and products.

As a result, the creation and mobilisation of firm wide resources were means to control **transaction costs** for bank/FI benefits (Benston and Smith, 1976), and reduce bank/FI problems arising out of **asymmetric information** (Akerlof, 1970; Leland and Pyle, 1977), for individual transactions and for all major classes of assets and liabilities in Bank/FI portfolios.

It should be noted that problems with knowledge and capabilities have been the basis for knowledge and social risks, which created information asymmetry, adverse selection and moral hazard problems. These increased transaction costs and contributed to financial risks. During the GFC this included problems with knowledge of: organisation structure and control processes, behaviour (in the firm, and in customer networks); incentives; and with financial expertise. Flawed decision capabilities and amoral (sometimes immoral) behaviour (Luyendijk, 2016) contributed to mis-selling problems with mortgages, and payment protection insurance in retail banking, leading to major financial penalties levied on banks and FIs.

5.2 Delegated monitoring

Diamond, (1984) argues that customers, supplying funds to bank/FIs, delegated the monitoring of their funds to a specialist financial intermediary. The BTFF develops these ideas by arguing that **delegated monitoring** was based on observable and partially observable Bank/FI intangibles and strengths, with these learnt, developed and mobilised over time. Rapid change can reduce the explanatory power of delegated monitoring theory.

In the BTFF, financial firms and customers learned together and jointly developed shared and observable intangibles such as 'relations', trust and reputation over time. Customers were in a position to partially observe or infer that banks and FIs developed special financial expertise, information sources, skills of front line staff, and access to markets. Unobservable advantages of bank and FIs included organisational structure, culture, controls over risk, knowledge intensive routines, specialised contracts, access to markets and other intangibles.

Individual customers were unlikely to be able to replicate these bank/FI advantages except at high cost. Customers were in a position to recognise that some financial firms had competitive advantages in innovation, product quality and market access compared to other competitors. Historic proxies such as: *quality of products, transaction success, customer satisfaction, reputation, brand, and financial performance*; provided substitute information for customers to infer the quality of these unobservable intangibles, and created positive conditions for future transacting.

Learning, special capabilities and customer relationships helped bank/FI front line staff to continue to reduce information asymmetry problems with customers before, during and after transacting, and thus reduced (moral hazard and adverse selection) behaviour problems for banks/FIs. As a result banks and FIs had knowledge and social advantages over customers in contracting, monitoring and renegotiating assets such as loans; and in reducing the costs of these activities (Holland, 1994). They also knew how to use portfolios (large number transactions, many segment) to diversify the risk of assets such as loans.

The paper argues that combinations of: *shared and observable financial firm-customer intangibles; partially observable Bank/FI capabilities; and unobservable advantages and their proxies;* was a basis for **delegated monitoring.** Individuals could not develop the special bank/FI advantages, but could use their observation (or assumption) of these advantages, as well as experience of transactions, relations and trust; to have confidence in transactions with bank/FIs. As a result customers, supplying funds to bank/FIs, **delegated** the monitoring of their savings, funding, or financial service transaction to a specialist financial intermediary (Diamond, 1984). Depositor or saver confidence in the reputation of banks or FIs was also buttressed by government insurance schemes (eg for deposits) and by financial firm regulation (Sinkey, 1989, p, 489-490). Holland (1994) notes how many connected intangibles such as access to information, relationships, and reputation, played a central role in 'delegated monitoring'

'The reputational capital of the bank … depends on its access to information… this information can be acquired by the bank because its joint production of depository, payment, loan and … other financial services for the client, generates many complementary types of information. Relationship banking can be seen as a further means to broaden this information base and can be interpreted as one means by which a bank can enhance its credibility as a delegated monitor. Under these conditions depositors more likely to transfer (delegate) their agency problem and their deposits to the bank'.

The bank/FI competitive advantages acquired by learning did not exist relative to all customers. A loss of advantage occurred when large corporate customers imitated bank/FI learning, and created their own intangibles in corporate treasuries (eg BP). They reduced their transaction costs, changed their behaviour and directly transacted in markets as savers/investors and borrowers. Large commercial firms (as potential customers) bypassed bank financial intermediation processes and raised funds and invested surplus cash directly in markets (Lewis and Davies, 1987). This occurred when large firms had established reputations for repaying debt, low perceived risk, and high expected profits. It occurred when they were transacting in well known financial services, and operated in information rich world concerning these matters. For example, these factors lowered information asymmetry and transaction costs with direct purchasers of company debt securities. Large firms could independently learn and develop the combination of shared intangibles such as 'relations', market access, trust and reputation, directly with suppliers of funds. They could develop their

own financial expertise, information sources and capabilities, concerning transactions such as bond issues. Bank/FIs had to match and exceed such learning with corporate customers to maintain a share of the corporate market.

Firms without these capabilities, had to become bank or FI customers. For example, they had to use banks for loans; and rely on delegated monitoring (of deposits) for banks to fund the loans. Banks and FIs therefore learnt how to develop a combination of superior fund raising capabilities and superior intangibles compared to such firms. The advantages provided the means for bank/FIs to reduce information asymmetry and transaction costs relative to firms and direct transacting in markets. As a result, delegated monitoring was based on strengths of combinations of tangibles, intangibles and behaviours developed and learnt over time.

Delegated monitoring, rapid change and problems.

Bank/FI advantages were continuously subject to erosion especially in period of rapid change. This was not just problems of customers from large firms. Technology created opportunities for retail savers and investors to learn and acquire advantages relative to banks and FIs and to reduce their reliance on **delegated monitoring.** For example, bank advantages and delegated monitoring by customers, faced serious challenges from the rise of 'disruptive technology' (Kan, 2014) such as combinations of social media, 'smart phones' and internet. These radically reduced the transaction costs of direct financing between individuals and companies.

Banks had to be proactive and learn about changes in expected customer behaviour in digital social networks and their impact on bank functions and bank agent behaviour. They had to use sophisticated analysis of large scale data sources on digital social networks to learn how their intangible advantages *(histories and track records, customer relations and trust, knowledge of transactions and customers, and their behaviour when transacting*), could be adapted and strengthened against such threats. They had to learn how to integrate the bank (technology and intangibles) into new customer products, such as new ways of payment, saving, insurance and borrowing.

They had to learn about new customer behaviour and how bank agents can adapt their behaviour with customers. New versions of the 'human touch' (in bank agents and bank system 'behaviour') integrated with new forms of technology had to be invented to create conditions for customers to continue to allow **delegated monitoring** by banks and for banks to manage new risks.

Rapid change, major problems and risks in socio-economic networks, technology, and knowledge capabilities can contribute to financial risks and reduce the explanatory power of delegated monitoring theory. In the extreme of sudden unanticipated events such theory has no explanatory power. Delegated monitoring by large scale investors failed during the GFC. Mortgages were mis-sold to credit-poor customers in the US and repackaged as high grade securities by banks and rating agencies. These were sold through many bank intermediaries and bought by ultimate investors. When the US housing market failed, many mortgages failed, leading to major value reductions in the securities. Initial contracting and subsequent monitoring along this transaction chain failed and ultimate investors lost large sums of money. This illustrates how problems with knowledge, capabilities, and behaviour, have been the basis for knowledge and social risks, and both contributed to financial risks.

5.3 Liquidity insurance theory - learning about customers, transactions and liquidity:

Diamond and Dybvig (1983) argued that financial intermediaries provided liquidity insurance. They created 'pools of liquidity' to insure customers against shocks that affect their consumption needs, and to help customers smooth their consumption. The BTFF develops these ideas by arguing that liquidity insurance was based on Bank/FI intangibles (social structures, financial and statistical expertise, and information), financial resources, and their combined strengths. These were learnt, developed and mobilised over time for liquidity management purposes. Rapid change can reduce the explanatory power of liquidity insurance theory.

Learning about financial resources and liquidity - developing financial expertise
During periods of stability and gradual change in customer behaviour and external conditions, gradual learning was possible about statistical and social processes concerning financial resources and their liquidity.

Liquidity management required active learning and development of liquidity management capabilities and financial expertise or expert knowledge (Preda, 2005). The latter included knowledge of required cash reserves, liquidity characteristics of assets and liabilities, and their statistical behaviour. Banks/FIs learnt how liquidity risks occurred on both sides of the balance sheet, liquidity varied with the nature of the liability or asset, and how various market mechanisms could be used to turn illiquid assets into cash. Learning also involved creating statistical knowledge about deposit portfolio risks and how to exploit the *'law of large numbers'* in retail depositor behaviour (Lewis and Davies, 1987). Banks learnt how to diversify liquidity risks across retail deposit segments and wholesale deposit segments.

Learning about social resources to support liquidity

Banks and FIs also learnt how customer's liquidity behaviour created diversification opportunities, and could be predicted and incentivised. This knowledge was the basis to manage social behaviour and its risks to control liquidity. They learnt how to adapt their behaviour and products, to create desirable behavioural liquidity conditions in customers, on both asset and liability sides.

Learning about **social assets** as networks or multiple 'relations' amongst customers (retail, wholesale,) clients, and other banks and FI was essential for liquidity management. For example, learning how to create customer 'relations' on both asset and liability sides of the balance sheets was essential. They were used to create unique 'socially based information systems' about customers, clients and other banks and FIs (Holland, 1994). 'Relations' as an *informal contract* were seen as an 'exchange of implicit insurance contracts' in which the banks or FIs offered to insure their customers against a portion of, or the major part of, the financial supply, liquidity, and financial price contingencies facing them (Holland, 1994).

Banks and FIs also used their social resources (reputation, ranking, 'relationships') and information systems to learn about variation and uncertainty in liability (eg depositor) behaviour (consumption and spending) across different customer segments during changing economic times and volatile periods. The customer segments could range from a set of retail customer segments, small businesses, large firms and large banks. They learnt how these liquidity behaviours were 'normally' offset (uncorrelated) and diversified; across a large number of customer segments. This was the basis to create a 'pool' of diversified liquid capital for investing in less liquid but more profitable assets (such as loans).

Over time management learnt how key intangibles could be combined and connected to influence customers. For example, high quality relational capital in the customer base could be merged with brand power and customer information systems to create information and influence advantages concerning customer behaviour (Chen et al, 2014). The combination created the capability to improve information conditions and reduce transaction costs arising during the initial search or screen for customer opportunities (in retail, investment and wholesale banking), in bargaining, and in monitoring customer use of a wide range of bank/FI services (Dahlman, 1979). The combination created capabilities to improve predictions of customer liquidity behaviour, incentivise customers, negotiate with customers, and reduce liquidity shocks.

Bank/FIs used this knowledge to incentivise 'relationship' customers to change levels of assets and liabilities and their liquidity characteristics when required. For example, in stable tiers in wholesale banking markets, small price increases were used to command deposits. In retail markets, preferential terms were offered to 'relationship' borrowers to encourage 'early settlements' of say hire purchase loans or credit card debt.

The above learning created bank/FI capabilities to be 'consumption smoothers' for their 'relationship' customers by offering insurance against consumer or depositor consumption shocks. The combination of knowledge, social relations, and technology created the means for retail banks and FIs to know how to 'satisfy the liquidity needs of individual investors' (**liquidity insurance theory**; Buckle et al, 2011). They were also the means for wholesale banks to satisfy the liquidity of other large banks in their shared 'tiers' (Lewis and Davies, 1987).

Learning about liquidity during rapid change and uncertainty

Rapid change, major problems and risks in socio-economic networks and markets contributed to financial risks and reduced the explanatory power of *Liquidity insurance theory.* Learning was difficult in periods of rapid change and was impossible when sudden shocks occurred and created uncertainty. Liquidity diversification benefits vanished during periods of uncertainty. This constrained bank use of some types of deposit sources such as wholesale deposits where systemic risk could quickly replace diversification benefits

During and post the GFC banks and FIs learnt how banks such as Northern Rock could experience a bank run on their retail bank deposits when they suffered a freeze on their interbank deposits. Historic learning by large established 'top tier' banks meant that in 2007 they withdrew their wholesale deposits from 'lower tier' banks such as Northern Rock. They did this with relatively smaller newcomer banks in a 'flight to quality' to avoid contagion and a bank panic. Lower tier banks learnt that they were in a fragile 'pecking order' or 'tier' for liquidity in interbank wholesale deposit markets, and they had to match their lending and asset liquidity decisions to this situation.

Inability to learn during gradual change, and limited financial firm knowledge during rapid change such as the GFC contributed to the severe liquidity problems. This involved limited knowledge of asset markets, social structures in markets, the nature of shocks, and fragility of asset and liability markets to sudden shocks. Stable social relations and stable statistical relations for liquidity of financial resources, both fell apart together when uncertainty occurred. Problems with capabilities and networks generated knowledge and social risks, which contributed to financial risks. The financial firms that survived without government help relied on liquidity of their slack resources and preparations made through use of early warning systems. The BTFF is designed to support such contingency planning by designing robust intangibles to support financial resource use in range of circumstances

5.4 Theory of asset transformation – learning about risk management at portfolio and firm levels:

Buckle et al (2011) note that financial intermediaries transformed assets in order to satisfy simultaneously the different requirements of financial capital users and suppliers in terms of maturity, size and risk. The BTFF develops these ideas by arguing that *asset transformation* was based on Bank/FI intangibles, financial resources, and their combined strengths. These were learnt, developed and mobilised over time. Rapid change can reduce the explanatory power of *asset transformation* theory.

This section begins with an assumption of stability or gradual change in the environment of banks and FIs. It discusses how financial expertise was a key knowledge source in asset transformation. However, other knowledge based and social intangibles were critical to full exploitation of financial expertise in financial capital transformation. This section also explores rapid change and uncertainty, how intangible resources became major sources of financial risks, and how asset transformation failed.

Financial expertise and asset transformation: - in conditions of stability or gradual change

Financial expertise was a specialized form of knowledge in banks and FIs, derived from experience, training and finance theory, and focused on financial resources alone. It played a critical role in the transformation of financial capital and its risks. More specifically, banks and FI management acquired expert knowledge (Preda, 2005) about a wide range of connected principles and mechanisms of financial risk management including, contracting, diversification, matching and mismatching, and use of reserves of capital and liquidity. Management mobilized this knowledge in the transformation of financial capital and its risks.

For example, they diversified financial risks using principles such as the 'law of large numbers' for loans and deposits, and MPT for equities. They diversified sources of liabilities and assets to invest in. Management matched and mismatched assets and liabilities, both on balance sheet, and in markets (re-insure, co-insure); and sought to influence asset and liability interest rates or returns for positive margins (Lewis and Davies, 1987). They used 'Off balance sheet' means in derivatives markets for liquidity management, risk management, and asset transformation. They used capital (cash and equity) as 'buffers' against liability and asset risks (eg deposit withdrawal, bad debt). They managed cross-balance sheet effects by exploiting **good asset** side performance and practice as signals to *encourage* the supply of capital, and vice versa.

The active mobilisation of expert knowledge or financial expertise in the above financial decision areas, by bank/FI agents, was the basis for creating information and controlling behaviour. This was used: to reduce transactions costs, control liquidity, and transform asset and liabilities by size, maturity and risk (Buckle et al 2011). The ongoing transactions and decisions about financial assets and liabilities were made by highly specialised 'front office' staff in financial markets for savings, investment and other financial services. Such risk management practices were also set by regulation based on established expert knowledge.

Thus top management learnt how all these financial risk factors interacted and could be managed ('juggled') together. They used financial expertise to create a stable bank or FI as a financial 'risk machine' exploiting relatively stable offsetting stochastic processes for assets and liabilities. They managed the interactions to allow the bank or FI to **intermediate** or transform financial capital by size, maturity, risk, and liquidity to create value or profit. They therefore learnt how to manage aggregate transaction risk in the form of financial asset and liability portfolio risks, and hence risks of intermediation processes in financial firms.

Asset transformation and joint risks of intangibles and financial resources:
- in conditions of stability or gradual change

Specialised financial knowledge had a central role in the transformation of financial capital and its risks in financial firms. However, section 3 has shown that Banks and FIs have learnt they must 'juggle' or manage the combination of intangibles risks (knowledge, social relations), tangibles risks (technology), and financial risks together. They have learnt it is not a question of managing financial resources and their risks alone in

transforming financial capital and its risks. Understanding intangibles and theirs risks were critical to understanding financial risks and to full exploitation of financial expertise.

The development of intellectual capital (IC) (Meritum, 2002), as human capital (HC), structural capital (SC), and social or relational capital (RC) was required for asset transformation. Learning about: financial expertise, other knowledge resources, social resources, and their risks; and how they interacted with financial resources and risks; was the basis to manage combined risks. These capabilities were means to create a stable bank or FI as a 'joint intangibles and financial risk machine' in which appropriate financial expertise, other knowledge and social resources, were matched to stochastic processes in financial resources. This was the basis for financial firms to manage special risks associated with intangibles and their impact on financial resources and risks (Chen et al, 2014; Holland, 2016). It was the means to use knowledge and social resources to transform financial resources or 'to satisfy simultaneously the different requirements of lenders and borrowers in terms of maturity, size, and risk' (as noted in **asset transformation theory** (Buckle et al 2011). Learning about these non financial matters was the basis for asset transformation with existing transactions and with future and promised transactions.

The GFC and technological change post 2007 showed how special risks arose in the intangibles and how these created financial risks. Active renewal of intangible resources through learning was essential for continued risk management. Recent development in integrated reporting (IIRC, 2013) has illustrated how boards and top managements teams in banks have sought to develop intangibles and construct them such that their unique intangible risks were managed, and the impact of their risks on financial risks (and other risks) was understood and managed (Larsen and Tan, 2015). Managing the new technological, knowledge and social media risks has required the development of new bank/FI skills and capabilities. Top management have had to learn how tangibles risks and intangible risks interact and have to be managed ('juggled') together to create a stable bank or FI made up of stable offsetting risks both tangible and intangible.

In finance theory terms internal based intangibles, technology and MIS, were designed to reduce information and behavioural problems within the firm. The internal intangibles included organisation structure, organisational control processes, employment contracts and incentive schemes. The combined resources were intended to reduce principal–agent problems between bank/FI board and top management teams, and between them and middle management and front line employees (Heffernan, 2005). This created stable internal knowledge and social conditions for using bank/FI financial expertise to match and mismatch balance sheet assets and liabilities by size, maturity and risk, and hence contributed to asset transformation.

Customer facing intangibles

Customer facing intangibles such as relations and brands, were also designed to control information and influence behavioural problems, and hence principal–agent problems with external agents such as corporate or retail customers (Heffernan. 2005). These resources created stable external conditions for: using bank/FI financial expertise to create information, find and satisfy customer needs in a predictable way, create trust when transacting, spread off balance sheet risks in markets; and hence contributed to asset transformation.

For example, Lewis and Davies (1987) discussed how in wholesale banks, learning about and maintaining 'tiers' (or 'clubs' of similar size and 'quality' banks) in interbank markets, was essential for banks to transact with each other in very large deposits. Holland (1994) also discussed how large banks:

'relied on multiple close(corporate) relations to guarantee a steady demand for their services. These were the base for rich flows of information concerning the financial needs and health of the client firms and were used by the banks to reduce the many risks faced in corporate banking.'

Social relations in interbank 'tiers' were the basis for wholesale supply of interbank deposits. Banks' relations within the 'tiers' and with core groups of large firms were also used for syndicated lending. Principles of financial risk sharing in wholesale markets, through re-insure and co-insure methods (Lewis and Davies, 1987), and associated financial metrics, depended on confidence conditions in 'tiers' or social

networks between banks of similar size, financial resources, and capabilities. Thus social networks were important means for exploiting financial expertise in the transformation of financial capital and its risks. Such select groups of large banks and large firms can be interpreted as 'status groups' (Preda, 2005) 'They emphasize reputation, honour and good social behaviour as stabilizers of collective action, as means of social control and as indicators of legitimacy' and they 'confer legitimacy upon financial actors and transactions'.

In the case of retail banks, learning about and creating customer relations was important for developing and maintaining brands and reputation in markets for deposit supply and loan demand. They learnt how customer experience and satisfaction contributed to bank reputation and brand power. Banks learnt how customer relations and trust were the means to ensure continuous information flows across various retail customer segments. Relations as an *informal contract* were seen as an 'exchange of implicit insurance contracts' concerning expected behaviour and transaction activity between banks and customers (Holland, 1994)

In both retail and wholesale cases learning about social networks and how to maintain them were means to create unique 'socially based information systems' about customers, clients, other banks and FIs (Holland, 1994). Social networks were central to, attracting and holding onto sources of funds (eg deposits), and to creating confidence in liability (eg deposit) mismatching with longer term assets (eg loans). Learning about these social assets, how to maintain them, and how to signal this information, was important to ensure capital suppliers (eg depositors) had confidence in asset/liability mismatches. It was important in understanding how to exploit financial expertise in the transformation of financial capital and its risks. The development of 'relations' created a form of two way insurance between banks and customers, and was a means to stabilise supply and demand behaviour concerning financial assets and liabilities. Understanding these social and behavioural contexts provided a basis for exploiting financial expertise in the transformation of financial capital and its risks.

Rapid change - Intangible resources as major sources of financial risks

Rapid change combined with limited learning can create major problems and exposure to risks in bank/FI socio-economic networks, technology, and knowledge capabilities. These can contribute to increased exposure to risk with financial resources. The combined exposure conditions can coincide with major unanticipated events, contribute to extreme financial risks, and potentially lead to bank/FI failure**.** Examples of major unanticipated events include, major technological failures in single financial firm or group of firms, 'disruptive technology' emerging in markets, and major issues of confidence between financial firms in inter firm markets and retail markets

In the GFC large banks lost confidence in each other and their financial resources, leading to a 'liquidity freeze' in interbank deposit markets. At the same time, socio-economic 'tiers' as transacting and risk sharing and risk ceding mechanisms (co-insure and re-insure methods, Lewis and Davies, 1987) failed for both deposit and credit markets. The problems with financial resources and social resources led to a failure in asset transformation. These events highlighted how financial risk and social risk were intimately connected.

In a retail bank example, special risks have arisen from the combination of knowledge, social networks and technology resources. Customers have used social media and the internet to magnify and broadcast their concerns with retail banks for service disruptions and loss of data, leading to rapid loss of trust and confidence. This has created correlations between previously uncorrelated customer behaviours and bank liabilities and assets leading to new systemic risks in asset transformation.

Such rapid change conditions have reduced the explanatory power of *asset transformation* theory and the effectiveness of financial expertise and associated risk management metrics for management. With extreme unanticipated events, all conventional statistical relations vanish (for financial resources and quantitative measures of their risks). In the extreme of sudden unanticipated events, knowledge resources such as asset transformation theory, financial expertise, and associated financial metrics, have had no explanatory power.

6. Implications for regulators and regulation

The development of an embryonic 'Behavioural theory of the financial firm' identifies two roles for regulators of financial firms. Firstly they can combine with other bodies to further develop a BTFF and 'conceptual connections' to established finance theory. Secondly they can use the BTFF and 'connections' to think about new ways to regulate financial firms, and construct a new regulatory architecture.

6.1 Further development of theory and research

Authors such as: Scholtens and Wensveen (2003), Keasey and Hudson, (2007) and Gendron's et al (2013); have recognised problems with finance theory, the need to introduce new ideas, and to improve theory construction processes. This paper has shown how this can be done in systematic manner. Regulators can play an active role here.

In the UK, the PRA, the FCA (and its predecessor the FSA; Turner, 2009) and Bank of England (King 2014, Carney 2015), have recognised the problems of traditional finance theory and the need for change. These regulatory agents could use their research capabilities and privileged access in banks and FIs to create knowledge about these firms. They could exploit recent development in integrated reporting (IIRC, 2013) and banking (Larsen and Tan, 2015) to promote this idea. They can demand that banks and FIs make a contribution to new 'theories of practice' and develop a more comprehensive 'Behavioural theory of the financial firm'.

Regulators can also play a role in encouraging academics to break out their discipline based 'silos' by co-operating with public bodies funding academic research. The latter can use their funding power and research evaluation power to influence the change process in finance research and theory construction. In the UK this involves research councils such as the ESRC and bodies such as HEFC and their involvement in research funding and research quality assessment processes (REF) of finance academics. All of the primary agents in the fields of practice and academe must liaise on joint change strategies to gain the maximum change effect. For example, key UK agents and bodies: such as bank/FI regulators in the form of the PRA, FCA and Bank of England: and Funding and Research councils such as HEFC and ESRC; as well as professional bodies; must liaise on 'developing empirical understandings of the social networks in which financial innovation occurs' (Rooney et al, 2013).

6.2 New ways to regulate financial firms:

The BTTF and the analysis of problems make it clear that regulators will have to assess how to influence bank/FI change and learning, and construction of knowledge and social resources. They will have to understand how these changes and intangibles contexts play a role in bank/FI conduct with customers in markets, and how change and new forms of conduct influence bank/FI financial risk and risk management.

For example, literature on 'organisational learning' could be used by regulators to think how to monitor and influence change processes**.** Pedler et al, (1997) discuss empirical findings and theoretical analysis of effective learning in large organisations. This could be the basis for 'good practice' guidance by regulators for bank/FI learning, and for integrated bank/FI reporting on their development of intangible drivers in their business model (IIRC, 2103). Other researchers such as Harris (2002), Antonacopoulou, (2006), Chivers, (2011), Royal et al (2012) provide insight into bank learning.

Stress testing of the financial parameters of business models, and of management choices for risk management, have been implemented by bank regulators (Bank of England, 2016). However, boards and top management in large banks and FIs especially those in the TBTF category must also be regularly assessed and 'stress tested' to see if they understand and believe in their models, have taken actions to ensure their models remain stable and robust; and their management skills remain relevant. Top management and board members in TBTF banks and FIs should be 'stress tested' on their knowledge and experience of how social and knowledge resources can be used to transform financial resources and risks. The BTFF offers a

framework to design the tests, and to structure public disclosure of tests of bank/FI management capabilities and attitudes. If they fail they should lose their 'masters ticket' to steer such large 'ships'. Stress testing can be extended to: financial firm organisation, routines, control systems, culture, stability of external networks; and how these factors interact in periods of high change and threat. Stress tests should not just focus on bank/FI capital, cash, liquidity and other financial parameters. They should concern these knowledge and social structures as sources of financial risk in TBTF banks, other FIs, and the wider financial system.

This paper argues that regulators should focus on changes in bank/FI social conditions, with particular focus on **culture and how it changes.** If we take the example of banks in 2017, regulators such as the FCA, BSB, and G30 sought to influence and change existing bank culture, and behaviour in transactions. They did so in the interests of fair dealing with customers and clients, and effective functioning of markets. These approaches may prove beneficial but desired changes in banking culture will always be limited if regulators ignore the wider context and changes discussed in the BTFF. However, regulators can understand, influence and, in part, manage bank culture, by using theoretical work such as Schein (2004) to think about bank culture and culture in a wider bank system. Understanding the role of culture can be enhanced if this single social factor is placed within a BTFF of many interacting social, knowledge, and financial resource factors.

Finally, the paper notes that new regulation has a strong focus on changing existing conduct by bank agents. For example, changes in the UK have been made in banks concerning capital and remuneration and risk management. Other changes such as the 'Senior Managers Regime' will hold bank top management accountable for misconduct. New joint regulation in July 2015 by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA) regulation in 2015 on responsibility of bank management (Allen Overy, 2014), was a positive move in this direction. However regulators can improve understanding of the role of board and top management factors if these ad hoc changes are placed within a BTFF of many interacting social, knowledge, and financial resource factors. Single factor analysis in a changing, interacting world, is the route to future failures.

7. Summary

The paper has sought to rethink empirical models and theory used in explaining banks and financial institutions, and to enhance the process of theory construction. The change strategy for finance research and theory construction involved using a combination of empirical and alternative theoretical narratives, to develop an embryonic 'behavioral theory of the financial firm'. This has been used to develop 'conceptual connections' to traditional finance theory ideas of financial intermediation.

This is a provisional response to the call post GFC by many authors such as Colander et al (2009), Holland (2010), Gendron at al (2013) for a new approach to developing theory in the world of finance and financial institutions and to respond to problems identified with theory. It therefore develops a stream of thought begun by Allen and Santomero (1998), and extended by Scholtens and van Wensveen (2003), Keasey and Hudson (2007), and Holland (2010).

The combined set of ideas demonstrates the potential to develop a new explanatory frame for financial firms. This approach does not seek to 'integrate' traditional finance theory and alternative theory in 'meta theory'. The more modest aim is to improve theory content by providing examples of conceptual 'connections' between theories. The approach provided means to address some of the problems identified with traditional finance theory, and to develop a strategy for active theory construction. The paper seeks both connections and diversity in paradigms used. This can enhance processes and incentives for academics and practitioners underpinning theory construction. The ideas developed also create new opportunities to challenge the aims and claims of finance theory, to propose changes in banks and FIs, and to suggest changes in the focus of regulation. If managers, regulators and academics wish to exploit FTFI in a changing world they must be aware of dynamic conceptual connections between BTFF and FTFI and not use a static version of FTFI by itself.

Finally, the paper provides a new analytical tool for policy makers and regulators. Regulators must broaden the focus of regulation and regulate change, learning, knowledge, culture, and not just conduct. They must focus on these and on knowledge and social resources, not just financial resources in banks and FIs. They must 'stress test' management knowledge, financial firm organisation, culture, as well as 'financials'.

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